

Claims

1. An electronic component for amplifying high-frequency power, comprising:

    a first power amplification transistor for amplifying a modulated high-frequency signal in a first frequency band;

    a second power amplification transistor for amplifying a modulated high frequency signal in a second frequency band;

    a first transistor for output detection for receiving an input signal of said first power amplification transistor and a first current mirror circuit for passing current proportional to current of the transistor;

    a second transistor for output detection for receiving an input signal of said second power amplification transistor and a second current mirror circuit for passing current proportional to the current of the transistor;

    a sense resistor connected commonly on a transfer side of said first current mirror circuit and a transfer side of said second current mirror circuit and converting current to voltage; and

    a bias control circuit for comparing a signal detected by said sense register with an output request level instruction signal and generating a bias current for said first and second power amplification transistors.

2. The electronic component for amplifying high-frequency power according to claim 1, wherein when an output level of a high frequency signal in said first frequency band and that

of a high frequency signal in said second frequency band are different from each other, a ratio between current in a transfer source of said first and second current mirror circuits and current on a transfer side is set so that magnitudes of currents flowing in said sense resistor become almost equal to each other in the case where either a first high-frequency power amplifying circuit or a second high-frequency power amplifying circuit operates at a maximum output level.

3. The electronic component for amplifying high-frequency power according to claim 1, wherein when an output level of the high frequency signal in said first frequency band and an output level of the high frequency signal in said second frequency band are different from each other, each of a size ratio between a transistor for amplification and a transistor for output detection in a final stage of said high-frequency power amplifying circuit and a size ratio of transistors constructing a current mirror circuit is set so that the magnitudes of currents flowing in said sense resistor become almost equal in the case where either a first high-frequency power amplifying circuit or a second high-frequency power amplifying circuit operates at a maximum output level.

4. The electronic component for amplifying high-frequency power according to claim 2, further comprising a common comparing circuit for comparing a signal detected by said sense register with an output request level instruction signal

supplied.

5. The electronic component for amplifying high-frequency power according to any one of claims 1 to 4, further comprising a transistor connected to said first power amplification transistor to form a current mirror circuit, and a transistor connected to said second power amplification transistor to form a current mirror circuit, wherein a bias voltage is applied to input terminals of said first and second power amplification transistors by passing a predetermined control current from said bias control circuit to said transistors for forming the current mirror circuits.

6. The electronic component for amplifying high-frequency power according to any one of claims 1 to 5, wherein said first and second current mirror circuits and said comparing circuit are formed over the same semiconductor chip, and said sense resistor is connected as a discrete part.

7. The electronic component for amplifying high-frequency power according to any one of claims 1 to 6, wherein a resistive element is provided each between said first transistor for output detection and the transistor in the transfer source of said first current mirror circuit and between said second transistor for output detection and the transistor in the transfer source of said second current mirror circuit.

8. The electronic component for amplifying high-frequency

power according to claim 7, wherein said resistive elements are connected as discrete parts.

9. The electronic component for amplifying high-frequency power according to claim 4, wherein a time constant circuit is provided between one of an input terminal and an output terminal of said comparing circuit, and an external terminal for connecting an element of the time constant circuit as an external element is provided.

10. The electronic component for amplifying high-frequency power according to claim 1, comprising:

a first amplifying circuit in which a plurality of power amplification transistors for amplifying a modulated high-frequency signal in a first frequency band are cascaded; and

a second amplifying circuit in which a plurality of power amplification transistors for amplifying a modulated high-frequency signal in a second frequency band are cascaded,

wherein said first transistor for output detection and said second transistor for output detection are constructed so as to receive input signals of the power amplification transistors in the final stage of said first and second amplifying circuits.

11. The electronic component for amplifying high-frequency power according to claim 10, wherein said first amplifying circuit amplifies a GSM transmission signal and said second

amplifying circuit amplifies a DCS transmission signal.

12. The electronic component for amplifying high-frequency power according to claim 11, further comprising:

a diode and a capacitor connected in series between an output terminal of said second amplifying circuit and a reference potential point; and

a switch transistor connected between a connection node of the diode and the capacitor and the reference potential point,

wherein the switch transistor is turned on when said first amplifying circuit is operated and is turned off when said second amplifying circuit is operated.

13. The electronic component for amplifying high-frequency power according to claim 12, wherein said switch transistor is a MOSFET having high breakdown voltage.

14. A radio communication system comprising:

an electronic component for amplifying high-frequency power according to claim 12;

a second electronic component including a transmission/reception switching circuit for switching between a transmission signal and a reception signal by using a diode and a signal switching means for switching between a signal in a first frequency band and a signal in a second frequency band;

a third electronic component for modulating a

transmission signal and inputting the modulated signal to said electronic component for amplifying high-frequency power; and

a semiconductor integrated circuit for applying an output request level instruction signal to said electronic component for amplifying high-frequency power.

15. An electronic component for amplifying high-frequency power, comprising:

a first power amplification transistor for amplifying a modulated high frequency signal in a first frequency band;

a second power amplification transistor for amplifying a modulated high frequency signal in a second frequency band;

a first transistor for output detection for receiving an input signal of said first power amplification transistor and a first current mirror circuit for passing current at a first ratio to current of the transistor;

a second transistor for output detection for receiving an input signal of said second power amplification transistor and a second current mirror circuit for passing current at a second ratio, which is different from said first ratio, to current of the transistor; and

a converting circuit commonly connected to said first and second current mirror circuits and converting current to voltage,

wherein a bias control circuit for comparing an output signal of said converting circuit with an output request level instruction signal and generating a bias current of said first

power amplification transistor.

16. The electronic component for amplifying high-frequency power according to claim 15, wherein said bias control circuit generates bias current of said second power amplification transistor.

17. A radio communication system comprising:  
an electronic component for amplifying high-frequency power according to claim 15;  
a second electronic component including a transmission/reception switching circuit for switching between a transmission signal and a reception signal by using a diode and a signal switching means for switching between a signal in a first frequency band and a signal in a second frequency band;  
a third electronic part for modulating a transmission signal and inputting the modulated signal to said electronic component for amplifying high-frequency power; and  
a semiconductor integrated circuit for applying an output request level instruction signal to said electronic component for amplifying high frequency power.